

Supplementary Material*

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* This supplementary material was provided by the authors to give readers further details on their article. The material was reviewed but not copyedited.

Supplement Table 1. Troponin reference thresholds for the identification of cases*

Type of troponin test	Hospital code	Reference threshold of elevated troponin (ng/L)
Troponin T, High sensitivity	Hospital 1	14.4999
	Hospital 2	14.4999
	Hospital 3	14.4999
Troponin T	Hospital 4	14.0000
	Hospital 5	13.9999
Troponin I, High sensitivity	Hospital 6	19.7999
		11.5999
		20.9999
	Hospital 7	19.8400
	Hospital 8	19.7999
		11.5999
		20.9999
	Hospital 9	19.8000
	Hospital 10	34.2000
		15.6000
		21.0000
		11.6400
		19.8400
	Hospital 11	15.6000
		34.2000
		30.9000
	Hospital 12	34.2000
		15.6000
		30.9000
	Hospital 13	19.8000
		11.6000
	Hospital 14	15.6000
		34.2000
		21.0000

* Multiple thresholds for the same hospital were due to different testing kits, each of which required independent calibration

Supplement Table 2. International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes used to identify diagnoses and clinical history

Description	ICD9 codes
Carditis	422.x, 429.0, 420.9, 423.9
<i>Included in the main analysis</i>	
Diabetes	250
Hypertension	401–405, 437.2
Coronary artery disease	414.01
Stroke	430, 431, 432, 433.01, 433.11, 433.21, 433.31, 433.81, 433.91, 434, 436, 437.0, 437.1, 435
Myocardial infarction	410.x – 411.x
Heart failure	398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428
Myositis	728.0, 728.11, 728.12, 728.81, 729.1
Encephalitis	323
<i>Further included in the sensitivity analysis</i>	
Smoking	V15.82, 305.1
Chronic obstructive pulmonary disease	490–496, 500–505, 506.4
Chronic kidney disease	585
Malignant neoplasm	140-209, 230.3, 230.4, 230.5, 230.6, 231.2, 233.0, 233.1, 233.4, 238.6
Schizophrenia	295.0–295.9
Asthma	493

Supplement Table 3. Drug name and British National Formulary (BNF) code used to identify prescription*

Description	Drug Name	BNF
<i>Included in the main analysis (as a binary indicator of cardiovascular medications, and as specific medications in sensitivity analysis)</i>		
Statin	Vastatin, Lipitor, Crestor, Zocor, Lescol, Caduet	-
Angiotensin-converting enzyme inhibitors	Benazepril, Captopril, Enalapril, Fosinopril, Lisinopril, Perindopril, Quinapril, Ramipril, Trandolapril	-
Angiotensin Receptor Blockers	Candesartan, Eprosartan, Irbesartan, Losartan, Olmesartan, Telmisartan, Valsartan	-
Digoxin	Digoxin	-
Anticoagulant	-	2.8.2
Antiplatelet medications	-	2.9
Beta-adrenoceptor blocking drugs	-	2.4
Calcium channel blockers	-	2.6.2
<i>Further included in the sensitivity analysis</i>		
Immune Checkpoint Inhibitors	Pembrolizumab, Nivolumab, Ipilimumab, Atezolizumab, Avelumab, Durvalumab	-
Clozapine	Clozapine	-
Valproate	Valproate	-
Diuretics	-	2.2

* For agents without corresponding BNF codes, drug names were applied.

Supplement Table 4. Sample characteristics of cases by vaccine status

	Unvaccinated 133	BNT162b2 20	CoronaVac 7
Demographics			
Sex: male (%)	78 (58.6)	17 (85.0)	5 (71.4)
Age [mean (standard deviation)]	62.09 (22.47)	25.40 (11.63)	61.43 (9.91)
Age group: aged 17 or below (%)	5 (3.8)	8 (40.0)	0 (0.0)
Clinical history (%)			
Diabetes	19 (14.3)	0 (0.0)	0 (0.0)
Hypertension	56 (42.1)	0 (0.0)	2 (28.6)
Coronary artery disease	0 (0.0)	0 (0.0)	0 (0.0)
Stroke	15 (11.3)	0 (0.0)	0 (0.0)
Heart failure	20 (15.0)	0 (0.0)	0 (0.0)
Myositis	1 (0.8)	0 (0.0)	0 (0.0)
Encephalitis	0 (0.0)	0 (0.0)	0 (0.0)
Cardiovascular medications ^b	76 (57.1)	0 (0.0)	2 (28.6)
Vaccination status (%)			
Received the second dose	-	15 (75.0)	6 (85.7)

* Cardiovascular medications include statins, angiotensin-converting enzyme, angiotensin receptor blockers, anticoagulants, antiplatelet, beta-adrenoceptor blocking drugs, calcium-channel blockers, and digoxin

Supplement Table 5. Odds ratios of carditis among vaccinated patients compared with unvaccinated patients (sensitivity analyses)

	Number of controls (%)	Number of cases (%)	Crude OR (95% CI)	Adjusted OR (95% CI) *
Cases with subsequent heart failure (and their matched controls) excluded				
Unvaccinated	1212 (91.3)	112 (80.6)	1 (ref)	1 (ref)
CoronaVac	54 (4.1)	7 (5.0)	1.48 (0.65, 3.39)	1.3 (0.56, 3.01)
BNT162b2	62 (4.7)	20 (14.4)	3.98 (2.13, 7.42)	3.85 (2.06, 7.20)
Covid-19 hospitalizations in controls removed				
Unvaccinated	1403 (91.8)	133 (83.1)	1 (ref)	1 (ref)
CoronaVac	60 (3.9)	7 (4.4)	1.28 (0.57, 2.90)	1.20 (0.53, 2.74)
BNT162b2	65 (4.3)	20 (12.5)	3.63 (1.97, 6.70)	3.53 (1.91, 6.55)
Additional covariates adjusted †				
Unvaccinated	1408 (91.8)	133 (83.1)	1 (ref)	1 (ref)
CoronaVac	65 (4.2)	7 (4.4)	1.29 (0.57, 2.91)	1.03 (0.44, 2.39)
BNT162b2	60 (3.9)	20 (12.5)	3.66 (1.99, 6.75)	3.23 (1.71, 6.07)
Patients vaccinated ≥14 days before admission recoded as non-exposed				
Unvaccinated	1489 (97.1)	141 (91.2)	1 (ref)	1 (ref)
CoronaVac	15 (1.0)	1 (0.6)	0.67 (0.09, 5.13)	0.63 (0.08, 4.85)
BNT162b2	29 (1.9)	18 (11.2)	8.12 (3.92, 16.83)	7.78 (3.76, 16.13)
Myocarditis				
Unvaccinated	362 (85.8)	24 (52.2)	1 (ref)	1 (ref)
CoronaVac	22 (5.2)	3 (6.5)	1.94 (0.51, 7.41)	1.44 (0.35, 5.90)
BNT162b2	38 (9.0)	19 (41.3)	10.12 (4.35, 23.59)	9.29 (3.94, 21.91)
Pericarditis				
Unvaccinated	1121 (93.9)	115 (93.5)	1 (ref)	1 (ref)
CoronaVac	39 (3.3)	4 (3.3)	0.99 (0.35, 2.84)	0.96 (0.33, 2.76)
BNT162b2	34 (2.8)	4 (3.3)	1.08 (0.36, 3.27)	1.06 (0.35, 3.22)
Carditis patients with no troponin test results included as cases				
Unvaccinated	2052 (92.3)	203 (87.9)	1 (ref)	1 (ref)
CoronaVac	80 (3.6)	8 (3.5)	1.03 (0.49, 2.20)	0.97 (0.45, 2.07)
BNT162b2	90 (4.1)	20 (8.7)	2.29 (1.32, 3.98)	2.22 (1.28, 3.87)
Comparing the first and second dose				
Unvaccinated	1408 (91.8)	133 (83.1)	1 (ref)	1 (ref)
CoronaVac - one dose	21 (1.4)	1 (0.6)	0.54 (0.07, 4.07)	0.53 (0.07, 4.02)
CoronaVac - two doses	39 (2.5)	6 (3.8)	1.68 (0.69, 4.07)	1.54 (0.63, 3.77)
BNT162b2 - one dose	27 (1.8)	5 (3.1)	2.30 (0.82, 6.44)	2.23 (0.80, 6.26)
BNT162b2 - two doses	38 (2.5)	15 (9.4)	4.48 (2.27, 8.86)	4.41 (2.22, 8.75)

* Adjusted variables: clinical history of diabetes, hypertension, coronary heart disease, stroke, heart failure, myositis, encephalitis, and cardiovascular medications prescribed within the past year prior to admission

† Further adjusted variables: clinical history of smoking, chronic obstructive pulmonary disease, chronic kidney disease, malignant neoplasm, schizophrenia, asthma, number of outpatient visits (past year), number of emergency room visits (past year), and number of hospitalized days (past year), and specific medications in the past year: immune checkpoint inhibitors, clozapine, valproate, diuretics in addition to specific cardiovascular medications (from main analysis)